*SFA Modernization Program*

**United States Department of Education**
**Student Financial Assistance**

# Campus-Based Programs
## Requirements Definition Document

***Task Order #13***
***Deliverable #13.4.2***

**October 6, 2000**

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# 1 Introduction

## 1.1 Purpose

This requirements definition document identifies functional and technical requirements for the proposed modernization of the Campus Based Program system. The objective of this analysis is to document, at a high level, the "as is" state of SFA legacy systems. The objective of the Mad Dog team is to identify and document functional and technical requirements for multiple system modernization options. These requirements will be gathered via interviews, site visits and walkthroughs with SFA staff, colleges/universities and current vendors. Finally, the team will develop a delivery schedule with milestones for each option.

## 1.2 Scope

This primary scope of this effort is to modernize the current Campus Based System. This modernization effort will focus on identifying requirements for the following: 1) migration from the current platform to a relational database platform; 2) development of a web-based front-end; and 3) software functionality enhancements. The Mad Dog team will capture and document functional and technical requirements for each option. These requirements will be gathered via interviews, site visits and walkthroughs with SFA staff, colleges/universities and current vendors.

The implementation phase will be assigned under a separate task order, and will be comprised of the work necessary to develop, test and implement the solution(s) approved from the Analyze system, technical or operational performance needs phase.

Systems that were evaluated include:

- Campus Based Systems (CB SYSTEM)
- Student Aid Interface Gateway component supporting CB systems
- CPS FISAP Software

The following is an overview of the current environment. The requirements for each option are presented separately subsequent sections.

## 1.3 Approach

The Modernization Partner will contribute to a small, highly skilled team to work in concert with U.S. Department of Education personnel to identify the requirements necessary to prepare a RFQ for operation of the Campus-Based System. In addition, the effort would identify requirements necessary to migrate to a relational database platform, develop a web-based front-end and additional software enhancements. In summary, the requirements definition will focus on the following areas:

- Requirements necessary to prepare the RFQ for operation of the Campus-Based System
- Requirements necessary for preparation of options for inclusion in the RFQ for operation of the Campus-Based System. These options are:
  - ✓ Requirements for migration to a relational database including:
    - Historical Data Requirements
  - ✓ Requirements for developing a web-based front-end
  - ✓ Requirements for additional software enhancements including:
    - Alternatives to TIVWAN
    - FISAP Edits w/o EDEXPRESS
- Development of a delivery schedule with milestones for each option.

The review work will require on-site visits to no more than 8 distinct locations – 5 colleges/universities, PHEEA, NCS, and UAL. The vendor sites may require multiple visits.

## 1.4 Organization of this Document

The following information was gathered for each of the systems identified above:

- **System Overview**: Identifies the functionality of each system

- **Contacts**: Lists resources that can assist in providing system-specific information

- **Production Environment Overview**: A topology of the current production environment.
  - **Technical Infrastructure**: Details the hardware and software components used within the production environment for each system

  - **Interfaces**: Defines the internal and external interfaces and data flows into and out of each legacy system.

  - **Process Flow Charts**: Provides a high-level graphical representation of the on-line and batch interfaces for each system.

- **Development Environment**: An assessment of the current development environment used to support analysis, design, construction, and maintenance of business systems, as well as the associated management processes. The development environment includes:

  - **Technical Infrastructure**: Details the hardware and software components used within the development environment for each system.

# 2 Campus Based Systems (CB SYSTEM)

## 2.1 System Overview

The Campus-Based System supports processing for the FISAP (Fiscal Operations Report and Application to Participate) cycle. It contains no student-level information; it uses only summary data by school.

The Campus Based System processes FISAP data received via EDConnect/SAIG, calculates funding formulas, and provides funding to schools for the Federal Perkins Loan, Federal SEOG, and Federal Work Study Programs.

Some major functions include:

- Process campus-based funding
- Maintain and edit FISAP data
- Calculate and notify institutional awards
- Allocate campus-based funds
- Reconcile accounts and reporting
- Default reduction assistance program

Note: The information collected for Campus Based System (CB SYSTEM) is valid as of October, 2000. Campus Based (CB) Operations is beginning a new contract on March 1, 2001 and the current Production and Development environments are scheduled to be replaced. During the month of Feb, CB will hold Source Board meetings to evaluate potential vendors for the new contract beginning October 1, 2000.

## 2.2 Contacts

| Title/Role | Name | Contact Number | e-mail |
|---|---|---|---|
| ED System Owner | Richard Coppage | 202-708-9797 | Richard_Coppage@ed.gov |
| Systems Administrator | Harrison Bannister | 202-708-5776 | Harrison_Bannister@ed.gov |
| Database Administrator (DBA) | Harrison Bannister | 202-708-5776 | Harrison_Bannister@ed.gov |
| Contact(s) for Development Access | Danny Dytang (UAL), Harrison Bannister (Operations) | 301-565-0032<br>202-708-5776 | ddytang@erols.com<br>Harrison_Bannister@ed.gov |
| Contact for Production Access | Danny Dytang (UAL), Harrison Bannister (Operations) | 301-565-0032<br>202-708-5776 | ddytang@erols.com<br>Harrison_Bannister@ed.gov |

# 2.3 Production Environment

## 2.3.1 Technical Infrastructure

### Logical Technical Architecture Topology (Current):

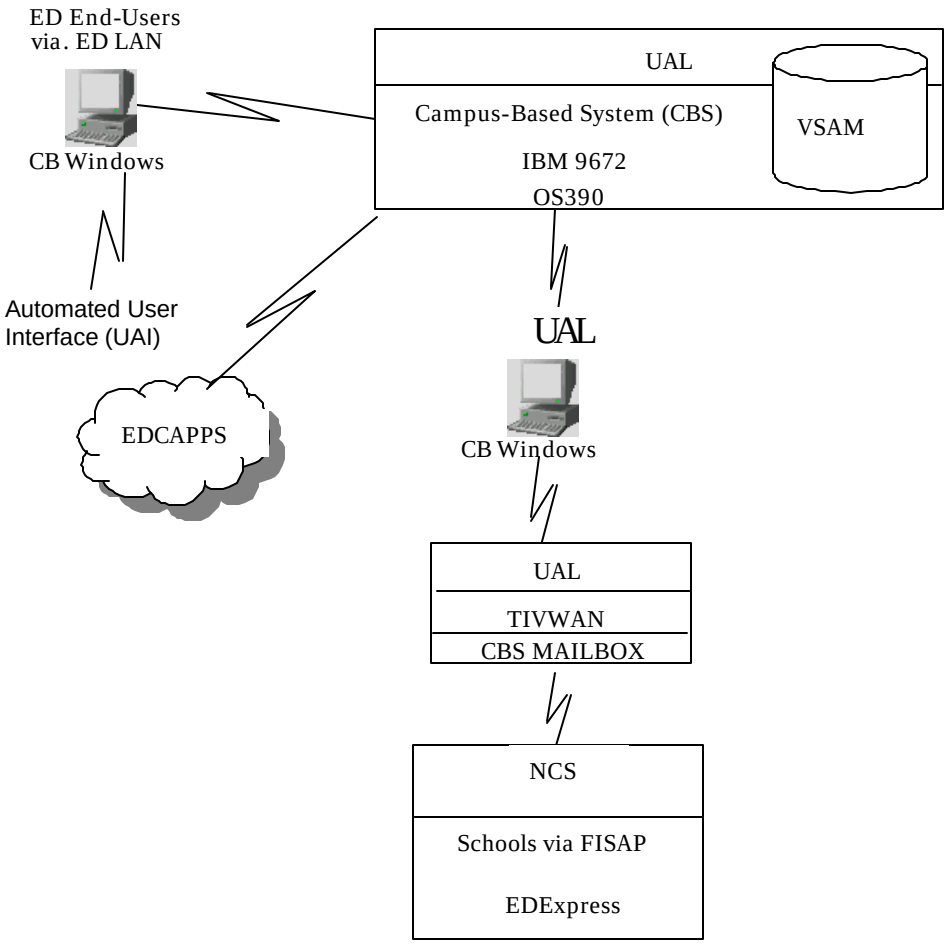



**Figure 1: CB SYSTEM Logical Technical Architecture Topology**

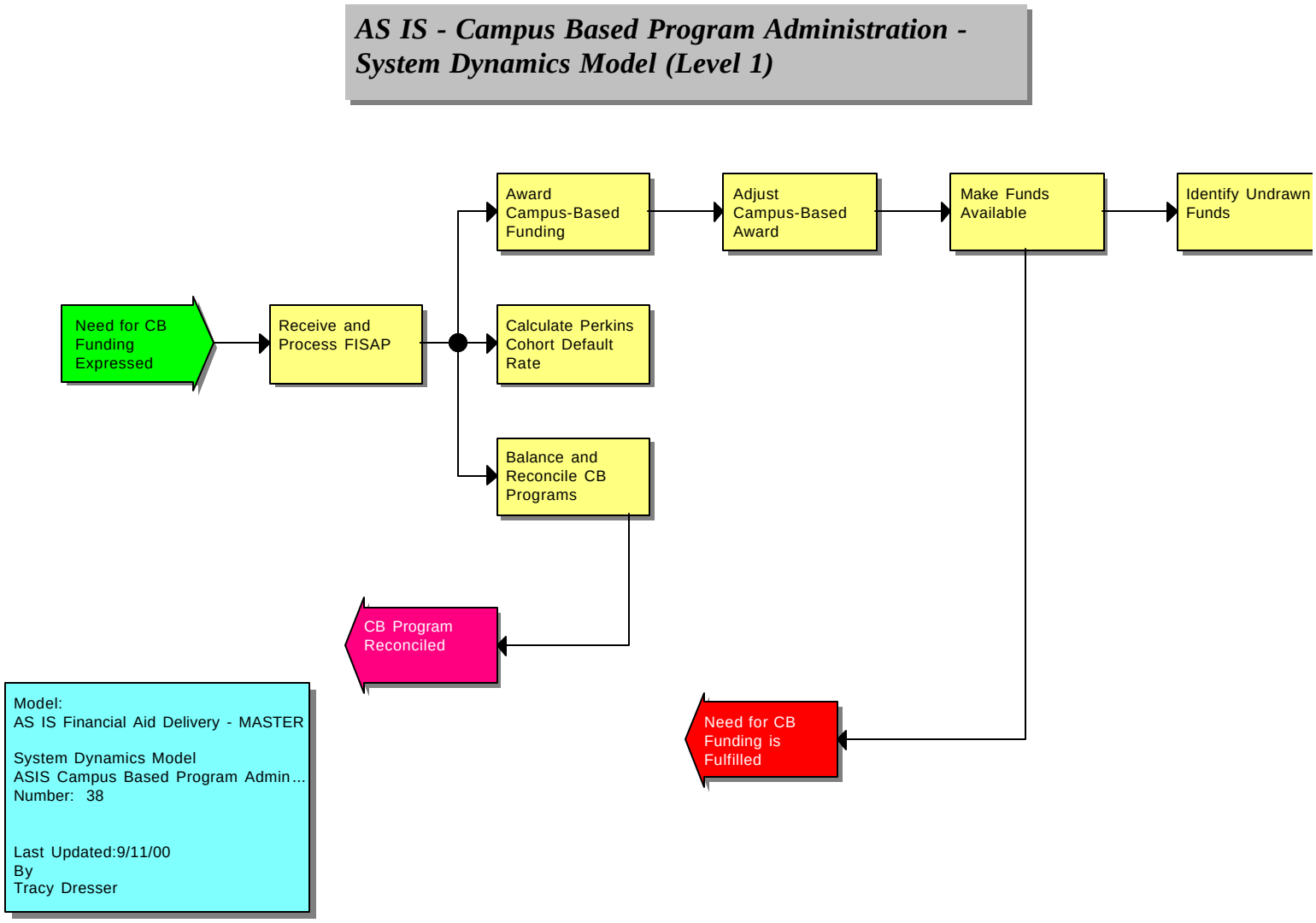
**Production Mainframe A:**

**Physical Location of Mainframe:** Meriden, CT

**Hardware/Software Components:**

| Category | Vendor | Product Name | Version |
|---|---|---|---|
| Platform/OS | IBM | 9672 / OS390 | RB5/2.4 |
| Database | IBM | VSAM | 2.4 |
| Transmission Protocol | IBM | SNA – LU | 6.2 |
| Middleware | IBM | CICS | 4.1 |
| Security Software | CSC | RACF | 2.20 |

## 2.3.2 Business Process Flow



## 2.3.3 Interfaces

**On-Line Interfaces:**

| System | Action | Object | System | Frequency | Communications (**A**synchronous/**S**ynchronous) | Volume of Data Processed |
|---|---|---|---|---|---|---|
| CB SYSTEM | Sends | ED Financial Accounting Transaction | ED CAPS/ GAPS | Approx. Weekly | Asynchronous | 200 bytes to 800,000 bytes |

**Batch Interfaces:**

| System | Action | Object | System | Frequency | Volume of Data Processed |
|---|---|---|---|---|---|
| CB SYSTEM | Sends | New FISAP Software Prior Year Data for new FISAP | (Schools) via SAIG Institutions | Once a year | 4000 bytes per application. 4000 applications sent to schools. |
| | Receives | New FISAP Applications, Error Corrections, Summary Disbursement Information | (Schools) via SAIG Institutions | 2-4 per year | 4000 bytes per application. 4000 applications from schools received randomly per year. |
| | Sends | FISAP Edit Files | (Schools) via TSAIG Institutions | 1-4 a year | 4000 bytes per application. Number of FISAP Application error corrections received varies. |
| | Sends | Award Authorization | ED CAPS/GAPS | 4000 in March and Weekly Adjustments | avg. 10 records per week. 180 bytes per record. Once a year, peak records reach 12,000 records in one batch. |
| | Sends | CB Windows data to desktop users | ED LAN to ED End Users | Daily | 200 MB per Snapshot, 1 Snapshot per day |

# 2.4 Development Environment

## 2.4.1 Technical Infrastructure

**Contracting Organization:** United Automated Labs (UAL)

**Developer Location:** Silver Spring, MD

**Development Mainframe**

**Physical Location of Mainframe:** Meriden, CT

*The Development mainframe mirrors the production mainframe.

# 3 Modernization of Campus Based Systems (CB SYSTEM)

## 3.1 Overview

This section identifies at a high level the technical and functional requirements necessary for modernizing the current Campus-Based system. Two main components are seen as critical first steps to modernizing the system: 1) migration from the current platform to a relational database platform and 2) development of a web-based front-end.

The migration of the current CB system to a relational database is a key component within the modernization effort. It will allow for the enhancements defined within this specification as well as position the CB for future integration with other SFA systems. Currently the system is on an IBM 9672 / OS390 that utilizes a VSAM file system for storage. It's this storage of Campus-Based data that shall be migrated to a relational data store and modifications to all systems that interface with the mainframe system.

Another key component for modernizing the system shall be for developing a web based or thin client application that will improve usability, reduce the level of support required to maintain and update the system year after year, and provide for superior & secure access.

## 3.2 Functional Requirements

### 3.2.1 Migration to Relational Database

Functional components for migrating the Campus-Based system to a relational database consist of 4 main areas: (1) the applications requirements for those systems impacted by the migration effort, (2) the conversion of data from an VSAM platform to a relational one, (3) the interfaces to internal and external systems and finally (4) reporting. The following section discusses the effort to migrate the CB system to a relational database.

All programs within the Campus-Based system will need to be scrutinized and modified appropriately to efficiently access the relational environment. The main components of the Campus-Based system are; the main processing system currently at UAL, the Automated User Interface (AUI), the CB-Windows application and the FISAP system that indirectly interfaces with the mainframe system through EDConnect & SAIG.

The main processing system at UAL contains the majority of the Campus-Based Program business logic. The UAL is currently comprised of approximately 200 Cobol programs and runs on an IBM 9672 / OS390. Some of the functions that the UAL system currently processes are Initialization of Previous Year, YTD loads, Allocations, Accounting, Institutional Information, Award Calculation, Award Notification, Unexpended Balance, Reconciliation, Receivables, Closeouts and the Maintenance of FISAP information. All of these functions will need to be updated to integrate with the relational database.

The AUI system provides access to the Campus-Based master file via a microprocessor terminal and is primarily used to produce mainframe reports and update institutional data within the CB SYSTEM Master File. Only designated "super-users" have access to administration functions that process the updates. The AUI system will need to be modified to access the relational database and provide the same level of security.

The CB-Windows system currently runs on an MS Access database that is updated nightly using change only file export from the mainframe. The primary function of the CB-Windows system is to support the CB staff in reconciling issues and reporting. The Access database will need to be eliminated and the CB-windows system migrated to access the relational database.

The FISAP system is currently a 32-bit, PC application developed primarily with VB++ and uses a 97 MS Access database. It is used by approximately 4,000 institutions for participation in three Campus-Based Programs; The Federal Perkins Loan, The Federal Supplemental Educational Opportunity Grant (FSEOG) and the Federal Work Study (FWS). As illustrated in the current production topology diagram the FISAP software interfaces directly with the TIVWAN and the CB system Mailbox for institutions/servicers. FISAP is comprised of a series of screens for each program that contain approximately 160 validation routines to ensure data has been entered correctly. Once the data has passed the validations or the errors have been successfully explained, the Institutions then transmit their request.

#### 3.2.1.1 Application Requirements

i. The contractor shall provide a system that provides a customizable component that will allow the Institution to setup its parameters such as, Funding Levels by School, Active Programs and Security Users & Groups.

ii. The contractor shall provide a system that protects against multiple panel access.

iii. The contractor shall provide a system that provides a communication component of the web site that allows for collaboration between Institutions along with providing the Campus Based Administration the ability to mass email Institutions.

iv. Reporting component of the site shall allow for both viewing standard reports along with the ability to develop ad-hoc reports. The reporting component shall contain at a minimum:

- Historical View by Year for the Institution
- Year over Year Comparison
- Similar Institutions Report by population, school types, (this would show only aggregate totals)

v. The contractor shall provide a system that provides the Department of Education staff with update access to award transaction history data.

vi. The contractor shall provide a system that provides the Department of Education staff with ability to update FISAP data or add a new school. These updates, deletions, and additions shall result in real-time updates to the database

vii. The contractor shall provide a system that provides the Department of Education staff with the ability to update, add, and delete school demographic data (name, address, identifiers). These updates, deletions, and additions shall result in real-time updates to the database.

viii. The contractor shall provide a system that provides the Department of Education with the ability to enter award adjustments on-line as they view processed award data for the

school they are entering the award adjustment. These unprocessed award adjustments shall be stored separately from the processed award adjustments. These updates, deletions, and additions shall result in real-time updates to the database.

ix. The contractor shall provide a system that allows for viewing of associated processed transactions for the same school, school year, and program of the unprocessed award adjustment in order to check for errors in the award adjustment.

x. The contractor shall provide a system that allows for submission of unprocessed transactions to a process that checks for award id validity and funding availability.

xi. The contractor shall provide a system that displays accepted and rejected transactions and the reason for the rejections.

xii. The contractor shall provide a system that allows the reviewer to selectively submit the accepted transactions for processing.

xiii. The contractor shall provide a system that allows the GAPS file and award letters to be regenerated for a processed transaction batch.

xiv. The contractor shall provide a system that provides the Department of Education staff with the ability to view authorization amounts and available balances by project code and fiscal year both before and after hold schools are taken into account. The results shall be displayed using real time data within the relation database at the time this data request is submitted.

xv. The contractor shall provide a system that provides Department of Education staff with ability to update and view base guarantees, LOE amounts, and cumulative Teacher Cancellation payments to institutions through on-line data entry screens.

xvi. The contractor shall provide a system that provides a view into the audit log of the database shall be provided. Updates, deletions, and insertions to FISAP data, demographic data, cumulative TC payments, and base guarantee data shall be viewed.

xvii. The contractor shall provide a system that provides the Department of Education staff with on-line entry and viewing screens for updating and adding entries to the telephone log. The current telephone log consists of the Campus-Based serial number, date of call, phone number of school, school person contacted, reason of call, and Department of Education staff name that made the log entry.

xviii. The contractor shall provide a system that provides the Department of Education staff with on-line viewing of FISAP edit errors.

xix. The contractor shall provide a system that provides the Department of Education staff with the ability to suppress edits either globally or by individual schools.

xx. The contractor shall provide a system that provides the Department of Education staff with the ability to run several simulations: tentative and final award, closeout award, teacher/service cancellation and reallocation.

xxi. The contractor shall provide a system that provides the Department of Education staff with the ability to print locally or download files that are currently generated each year from the various simulations.

xxii. The contractor shall provide a system that provides the Department of Education staff with the ability to enter parameters and upload LEAP figures by state for tentative and final allocation simulations and actual runs.

xxiii. The contractor shall provide a system that provides the Department of Education staff with the ability to upload a PEPS eligibility flag by OPEID into the relation database for use in creating the hold file for final award allocations.

xxiv. The contractor shall provide a system that provides the Department of Education staff with the ability to generate edit reports and other quality control reports used to find possibly incorrect FISAP data submitted by schools each year. The reports shall also be accessible on-line as well as downloadable files.

xxv. The contractor shall provide a detailed proposal on options to update the above systems to integrate with a relational database while ensuring performance is maintained or enhanced.

xxvi. The contractor shall propose an architecture where the database shall interface a system that provides the same functionality as the current AUI system does. This is on-demand with a weekly frequency. The data transmitted will be less than 500 bytes in general.

xxvii. The FISAP system shall interface directly with the database. The frequency during peak times will be daily with small packets of data, in general less than 1,500 bytes. The volume is dependent on whether partial or incomplete saves are performed.

xxviii. The contractor shall propose an architecture that provides an audit trail of database activity shall be kept with reporting capability for the Department of Education designated representatives. Typical database activity shall include updates, deletions, and insertions to FISAP data, demographic data, cumulative TC payments, and base guarantee data.

xxix. The contractor shall propose an architecture that shall continue to export data to all appropriate systems.

#### 3.2.1.2 Architecture Requirements

i. The contractor shall propose an architecture that adheres to the Department of Education's standard architecture for web development.
ii. The contractor shall propose an architecture that supports for access of up to 6000 concurrent sign-on.

iii. The contractor shall propose an architecture that supports concurrent multiple user access for a single institution.

iv. The contractor shall propose an architecture that provides a user interface compatibility with web client software versions in common use at the time of development (e.g., Netscape Navigator 4.x, Microsoft Internet Explorer 4.01+, AOL 4+).

v. The contractor shall propose an architecture that provides an interface with the Campus-Based relational database.

vi. The contractor shall propose an architecture that provides an interface with the OSFAP Portal requirements including single sign-on.

vii. The contractor shall propose an architecture that provides a user interface compatible with display resolutions in common use at the time of development (e.g., 800x600).

viii. The contractor shall propose an architecture that provides a user interface compatible with screen reader software in common use at the time of development.

ix. The contractor shall propose an architecture that interfaces with the Campus-Based relational database.

x. The contractor shall propose an architecture that interfaces with the OSFAP Portal requirements including single sign-on.

xi. The contractor shall propose an architecture that interfaces with both client and server systems using Internet protocols.

xii. The contractor shall propose an architecture that interfaces with clients using HTTP 1.0.

xiii. If required, the system shall provide secure client access using SSL 2.0.

xiv. The contractor shall propose an architecture that interfaces with database servers using the ANSI SQL92 query syntax.

xv. The contractor shall perform sufficient investigation into the sites traffic and usage patterns needs to occur and confirmation that current hardware requirements and network capacity satisfies the sites needs.

xvi. The contractor shall propose an architecture to maximize server side processing to reduce the complexity and size of the site's pages.

xvii. The contractor shall propose an architecture that limits the number of JavaScript edits for field and simple dependency edits.

xviii. The contractor shall propose an architecture where the core application is written in a language that allows threading.

xix. The contractor shall propose an architecture where the relational database shall be used to store partial data entered by a user to reduce the amount of data being held and also allows for improved disaster/recovery.

xx. The contractor shall ensure that ample time is considered for load testing. This is a critical component of the testing process that helps to ensure customers of optimal performance and scalability.

xxi. The contractor shall propose an architecture where the Database Connection Pooling shall be considered in the design of this site.

xxii. The contractor shall propose an architecture where validation shall be a component of the web site that allows for easy access and maintenance. It is the desire of the Department of Education that only one set of edits is maintained and that all systems that require the validation routines to be exercised could access the component.

xxiii. The contractor shall propose an architecture that performs "Authentication" (UserID/Password validation) and "Authorization" (individual and group level privileges) using a common encryption algorithm on volatile database information.

xxiv. The contractor shall propose an architecture that allows for integration with the OSFAP Portal single login component.

xxv. The contractor shall provide a system that provides the ability to process Servicer's data for the Institutions they represent.

xxvi. The contractor shall provide a system that will perform the standard validation routines on data submitted by Servicer's prior to incorporation into the CB database.

xxvii. The contractor shall propose an architecture where components will contain complete administration functionality for Management (Register for PIN, Change PIN, Reset PIN), Authentication (Login Validation & Authorization assignment) and Privilege Administration (Management of Individual and Group Level Privileges).

xxviii. The contractor shall provide a detailed proposal on options to update the above systems to integrate with a relational database while ensuring performance is maintained or enhanced.

xxix. The contractor shall propose an architecture where the database shall interface a system that provides the same functionality as the current AUI system does. This is on-demand with a weekly frequency. The data transmitted will be less than 500 bytes in general.

xxx. The contractor shall ensure that the FISAP system interfaces directly with the database. The frequency during peak times will be daily with small packets of data, in general less than 1,500 bytes. The volume is dependent on whether partial or incomplete saves are performed.

xxxi. The contractor shall propose an architecture that provides an audit trail of database activity shall be kept with reporting capability for the Department of Education designated representatives. Typical database activity shall include updates, deletions, and insertions to FISAP data, demographic data, cumulative TC payments, and base guarantee data.

xxxii. The contractor shall propose an architecture that shall continue to export data to all appropriate systems.

xxxiii. The contractor shall adhere to the Technology and Policy Standards for any new component or system development. In addition, enhancements to the Campus-based System should comply with OSFAP standards as stated in the Technology and Policy Standards Guide.

xxxiv. The contractor shall propose a database architecture that allows in general common select access for reporting tools.

xxxv. The contractor shall propose a database architecture that allows application level access with the proper privileges.

xxxvi. The contractor shall propose a database architecture that provides a schema that not only supports the on-line applications, but will effectively support standard reporting, ad-hoc and On-line Analytical Processing (OLAP) analysis.

#### 3.2.1.3 Data Conversion

i. The contractor shall propose an approach to for archiving the necessary data.

ii. The contractor shall propose an approach where the award ID used for the last four digits of the award document number shall be assigned each year independently of the Campus-Based serial number. Values for the award ID for each participating Campus-Based school shall be assigned using some algorithm and stored each year before final awards are run. In conjunction all current award data in the Campus-Based system shall be converted to separate the award ID from the serial number.

iii. The contractor shall propose an approach where each award ID shall have a serial number and school year associated with it.

iv. The contractor shall propose an approach where the Common Accounting Numbers (CANS) shall not be migrated to the relation database. All programs using CANS shall be converted to use project codes and fiscal years.

v. The contractor shall propose an approach where all authorization data shall be converted to contain their corresponding project code, fiscal year, appropriation code, object class, organization code, authorization amount, and description.

vi. The contractor shall propose an approach where all award data shall be converted to the format GAPS uses to store award data.

vii. The contractor shall propose an approach where each award shall have associated with it a serial number, document prefix, document year, award ID, school year, project code, fiscal year, amount, effective date, award type code, user id, and reason for award. All new awards shall be stored in this format. Award amounts shall be stored as positive and negative numbers.

viii. The contractor shall propose an approach where EINs shall not be stored in the relation database or used in any program.

ix. The contractor shall propose an approach where all year data shall be stored and displayed as 4 digits. Designations such as FYL, FYM, etc. for each application year shall be replaced with the appropriate four-digit school year or application year designation.

x. The contractor shall propose an approach where the current telephone log contained in a MS Access database shall be migrated into the relational database.

xi. The contractor shall propose an approach where Department of Education staff shall have access to the relational database 24 hours a day, seven days a week. Availability shall be at least 97%, with the exception of scheduled maintenance.

xii. The contractor shall propose an approach where all funding, award, and expenditure data, as well as any other currency data shall be stored with both dollars and cents.

xiii. The contractor shall propose an approach where all current currency data in the Campus-Based system shall be converted and all future currency data shall be stored with dollars and cents.

xiv. As part of the migration particular key data elements shall be available to Department of Education staff either through their interface to the relational database or through ad-hoc queries to the relational database. Samples of the key elements are:

1. 5 years of FISAP data starting with the current year shall be available for viewing through the user interface. As FISAP data becomes more than 5 years old, the data shall be archived and be available through ad-hoc queries. Electronic FISAP data contained in the current Campus-Based system that is 6 years or older (FYA through FYH and before) shall be archived in the relation database at conversion and be available by ad-hoc queries.

2. Accounting transaction history records from 1985 through the present shall be available for viewing through the user interface. Accounting transactions before 1985 shall be archived and be available through ad-hoc queries

3. Accounting transactions that become over 25 years old shall be archived.

4. Tracking dates for two years shall be viewable through the user interface. Tracking dates older than 2 years shall be archived.

5. Tentative and Final award worksheets for 5 application years shall be viewable through the user interface. As tentative and final worksheets become more than 5 years old, the data shall be archived and be available through ad-hoc queries.

6. Hold release data for three years shall be available for viewing through the user interface. As hold release data becomes more than three years old, the data shall be archived.

7. Teacher cancellation worksheets and award letters for 5 award years shall be viewable through the user interface. As worksheets become more than 5 years old, the data shall be archived and be available through ad-hoc queries.

8. Two years of telephone log data shall be viewable through the user interface. As telephone log data becomes more than two years old, the data shall be archived.

xv. A minimum of three years of under-use waiver, community service waiver, and FWS/FSEOG matching waiver data shall be viewable by Department of Education staff. As this data is no longer displayed on the user interface, the data shall be archived.

## 3.2.2 Campus-Based Web Site

The Campus-Based web site is solely for the use of Institutions and representatives of the Department of Educations. Its core functionality will not be accessible by the general Internet population. Currently the program has approximately 4,000 institutions. It is estimated that each institution will have 2-4 staff members that have varying levels of access to the system.

The web site can be inclusive of all the systems listed in section 3.2.1.1 or any combination. These systems are the main processing system (UAL), the Automated User Interface (AUI), the CB-Windows applications and the FISAP system. It goes without saying that the coordination of the web-

based front-end with the relational database migration activities is critical to the success of either endeavor.

#### 3.2.2.1 Application Requirements

i. The contractor shall provide technical support for all organizations requesting CB program's specifications and test cases. The support shall include response to specification questions from the beginning of the testing process and assistance with test case results.

ii. The contractor shall provide all requested technical support to the recipients of the Electronic Application Web-based, Mid-range, mini-computer software and specifications as an aspect of its customer service obligations under this contract. The technical support obligation shall encompass the comprehensive interpretation of the software and specifications, their application in specific hardware/software environments as well as an identical level of support for all contractor-produced materials supporting or related to the software and specifications.

iii. The contractor shall provide a system that provides a customizable component that will allow the Institution to setup its parameters such as Funding Levels by School, Active Programs and Security Users & Groups.

iv. The contractor shall provide a system that provides the regional offices with the appropriate level of inquiry and update access to CB data.

v. The contractor shall provide a system that protects against multiple panel access.

vi. The contractor shall provide a system that provides a communication component of the web site that allows for collaboration between Institutions along with providing the Campus Based Administration the ability to mass email Institutions.

vii. Reporting component of the site shall allow for both viewing standard reports along with the ability to develop ad-hoc reports. The reporting component shall contain at a minimum:

- Historical View by Year for the Institution
- Multi-year comparisons
- Similar Institutions Report by population, school types, to that which show only aggregate totals

viii. The contractor shall provide a system that provides the Department of Education staff with update access to award transaction history data.

ix. The contractor shall provide a system that provides the Department of Education staff with ability to update FISAP data or add a new school. These updates, deletions, and additions shall result in real-time updates to the database

x. The contractor shall provide a system that provides the Department of Education staff with the ability to update, add, and delete school demographic data (name, address, identifiers). These updates, deletions, and additions shall result in real-time updates to the database.

xi. The contractor shall design a system that allows ED staff to view unprocessed award data for the school for which they are entering the award adjustment. These unprocessed award

adjustments shall be stored separately from the processed award adjustments. These updates, deletions, and additions shall result in real-time updates to the database.

xii. The contractor shall provide a system that allows for viewing of associated processed transactions for the same school, school year, and program of the unprocessed award adjustment in order to check for errors in the award adjustment.

xiii. The contractor shall provide a system that allows for submission of unprocessed transactions to a process that checks for the validity of award IDs.

xiv. The contractor shall provide a system that displays accepted and rejected transactions and the reason for the rejections.

xv. The contractor shall provide a system that allows the reviewer to selectively submit the accepted transactions for processing.

xvi. The contractor shall provide a system that allows the GAPS file and award letters to be regenerated for a processed transaction batch.

xvii. The contractor shall provide a system that provides ED staff with the ability to view authorization amounts and available balances by project code and fiscal year both before and after allocations have been made to schools that have been placed on hold.

xviii. The contractor shall provide a system that provides Department of Education staff with ability to update and view base guarantees, LOE amounts, and cumulative Teacher Cancellation payments to institutions through on-line data entry screens.

xix. The contractor shall provide a system that provides a view into the audit log of the database. Updates, deletions, and insertions to FISAP data, demographic data, cumulative TC payments, and base guarantee data shall be viewed.

xx. The contractor shall provide a system that provides ED staff with on-line entry and viewing screens for updating and adding entries to the telephone log. The current telephone log consists of the Campus-Based serial number, date of call, phone number of school, school person contacted, reason of call, and Department of Education staff name that made the log entry.

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xxiv. The contractor shall provide a system that provides the Department of Education staff with the ability to print locally or download files that are currently generated each year from the various simulations.

xxv. The contractor shall provide a system that provides the Department of Education staff with the ability to enter parameters and upload LEAP figures by state for tentative and final allocation simulations and actual runs.

xxvi. The contractor shall provide a system that provides the Department of Education staff with the ability to upload a PEPS eligibility flag by OPEID into the relation database for use in creating the hold file for final award allocations.

xxvii. The contractor shall provide a system that provides the Department of Education staff with the ability to generate edit reports and other quality control reports used to find possibly incorrect FISAP data submitted by schools each year. The reports shall also be accessible on-line as well as downloadable files.

xxviii. The contractor shall propose an architecture where the database shall interface a system that provides the same functionality as the current AUI system does. This is on-demand with a weekly frequency. The data transmitted will be less than 500 bytes in general.

xxix. The contractor shall ensure that the FISAP software interfaces directly with the database. The frequency during peak times will be daily with small packets of data, in general less than 1,500 bytes. The volume is dependent on whether partial or incomplete saves are performed.

xxx. The contractor shall propose an architecture that provides an audit trail of database activity shall be kept with reporting capability for the Department of Education designated representatives. Typical database activity shall include updates, deletions, and insertions to FISAP data, demographic data, cumulative TC payments, and base guarantee data.

xxxi. The contractor shall propose a database architecture that provides a schema that not only supports the on-line applications, but will effectively support standard reporting, ad-hoc and On-line Analytical Processing (OLAP) analysis.

#### 3.2.2.2 Architecture Requirements

i. The contractor shall propose an architecture that adheres to the Department of Education's standard architecture of web development.

ii. The contractor shall propose an architecture that supports for access of up to 12,000 concurrent sign-ons.

iii. The contractor shall propose an architecture that supports concurrent multiple user access for a single institution.

iv. The contractor shall propose an architecture that provides an interface with the Campus-Based relational database.

v. The contractor shall propose an architecture that provides a user interface compatible with screen reader software in common use at the time of development.

vi. The contractor shall propose an architecture that interfaces with the Campus-Based relational database.

vii. The contractor shall propose an architecture that interfaces with the OSFAP Portal requirements including single sign-on.

viii. The contractor shall propose an architecture that interfaces with both client and server systems using Internet protocols.

ix. The contractor shall perform sufficient investigation into the sites traffic and usage patterns needs to occur and confirmation that current hardware requirements and network capacity satisfies the site's needs.

x. The contractor shall propose an architecture to maximize server side processing to reduce the complexity and size of the site's pages.

xi. The contractor shall propose an architecture that limits the number of JavaScript edits for field and simple dependency edits.

xii. The contractor shall propose an architecture where the core application is written in a language that allows threading.

xiii. The contractor shall propose an architecture where the relational database shall be used to store partial data entered by a user to reduce the amount of data being held and also allows for improved disaster/recovery.

xiv. The contractor shall ensure that ample time is considered for load testing. This is a critical component of the testing process that helps to ensure customers of optimal performance and scalability.

xv. The contractor shall propose an architecture where the Database Connection Pooling shall be considered in the design of this site.

xvi. The contractor shall propose an architecture where validation shall be a component of the web site that allows for easy access and maintenance. It is the desire of the Department of Education that only one set of edits is maintained and that all systems that require the validation routines to be exercised could access the component.

xvii. The contractor shall provide a system that provides the ability to process Servicer's data for the Institutions they represent.

xviii. The contractor shall provide a system that will perform the standard validation routines on all data prior to incorporation into the CB database.

xix. The contractor shall propose an architecture where components will contain complete administration functionality for Management (Register for PIN, Change PIN, Reset PIN), Authentication (Login Validation & Authorization assignment) and Privilege Administration (Management of Individual and Group Level Privileges).

xx. The contractor shall provide a detailed proposal on options to update the above systems to integrate with a relational database while ensuring performance is maintained or enhanced.

xxi. The contractor shall propose an architecture where the database shall interface a system that provides the same functionality as the current AUI system does. This is on-demand with a weekly frequency. The data transmitted will be less than 500 bytes in general.

xxii. The contractor shall ensure that the FISAP system interfaces directly with the database.

xxiii. The contractor shall propose an architecture that provides an audit trail of database activity and that contractor shall report this information to ED's designated representative.

xxiv. The contractor shall propose an architecture that shall continue to export data to all appropriate systems.

xxv. The contractor shall adhere to the Technology and Policy Standards for any new component or system development. In addition, enhancements to the Campus-based System should comply with OSFAP standards as stated in the Technology and Policy Standards Guide.

xxvi. The contractor shall propose a database architecture that allows in general common select access for reporting tools.

xxvii. The contractor shall propose a database architecture that allows application level access with the proper privileges.

xxviii. The contractor shall propose a database architecture that provides a schema that not only supports the on-line applications, but also effectively supports standard reporting, ad-hoc and On-line Analytical Processing (OLAP) analysis.

# 4 Applicable Standards and Resources

## 4.1 Technical

- Fiscal Operations Report for 1999-2000 & Application to Participate for 2001-2002 (FISAP) (cb00-10a.pdf, OMB 1845-0030)
- FISAP – Record Layouts (0102log.900.doc)
- FISAP - Setup(0102log.901.doc)
- FISAP - Tools(0102log.902.doc)
- FISAP - Entry(0102log.903.doc)
- FISAP – Process(Validation) (0102log.904.doc)
- FISAP - Import(0102log.905.doc)
- FISAP - Export(0102log.906.doc)
- FISAP - Print(0102log.907.doc)
- Program Finance Requirements (Universal Automation Labs, 11/12/1997)
- SFA WEB Graphical User Interface Guidelines, v1.6 - Draft (June 20, 2000)
- Automated User Interface (AUI) System Program Maintenance Manual
- CB-Windows Program Maintenance Manual
- PC Subsystems Program Maintenance Manual
- CB Program Maintenance Manual

## 4.2 Security

- The Computer Security Act of 1987
- The Privacy Act of 1974, (5 U.S.C. 522a, as amended)
- The Information Technology Management Reform Act of 1996 (40 U.S.C. Chapter 25)Executive Order 13011
- OMB Circular A-130, Appendix III
- OMB Memorandum M-00-07 (Incorporating and Funding Security in Information Systems Investments) [February 28, 2000]
- Federal CIO Council Information Security Maturity Framework v2(draft) [December 8, 1999]
- NIST Security Planning Guide 800-18 - Guide for Developing Security Plans for Information Technology Systems [December 1998]
- Information Technology Security Policy of the U.S. Department of education [1999]
- U.S. Department of education Certification & Accreditation Plan [September 30, 1999]
- U.S. Department of education Information Technology Continuity of Operations Planning(COOP) Program Guidance [November 5, 1999]
- U.S. Department of education Risk Management Program Guide (DRAFT) [August 27, 1999]
- U. S. Department of education Incident Handling Program Guide [February 2000]
- U. S. Department of education Information Technology (IT) Security Awareness and Training Program [October 1999]
- Office of Student Financial Assistance Guide to Information Security and Privacy (DRAFT)[September 2000]

## 4.3 Accessibility

- Workforce Investment Act of 1998 Section 508, Electronic and Information Technology
- Web Content Accessibility Guidelines 1.0 (W3C Recommendation 5-May-1999)
- Requirements for Accessible Software Design Version 1.2 (Office of the Chief Information Officer, US Department of education)
- Proposed Electronic and Information Technology Accessibility Standards (36 CFR Part 1194)
- Accessible Web Design Guidelines (Microsoft, http://www.microsoft.com/enable/dev/web/)
- Making Your Web Site Accessible to the Blind (Curtis Chong, Director of Technology, National Federation of the Blind)